With the assistance of Mrs. Draper, Mr. George F. Barker was accordingly requested to collect from Dr. Draper's copious notes the facts here detailed in connection with his experiments. Some supplementary measurements have also been made to test the efficiency of the apparatus.—The genus Pyrgulifera, Meek, and its associates and congeners, by Charles A. White. These molluscan forms, constituting the Bear River Laramic fauna of the author, are not found among any other North American fauna, either fossil or recent, but appear to have their congeners in a fauna still surviving in Lake Tanganyika, Central Africa, as well as in the Upper Cretaceous fresh-water deposits of Hungary.—On the occurrence of native mercury in the alluvium in Louisiana, by Ernest Wilkinson. Native mercury has recently been unexpectedly discovered at Cedar Grove Plantation, Jefferson Parish, Louisiana, where it is found disseminated in small globules in the mean proportion of 0·002934 per cent. throughout the alluvial soil. It also occurs elsewhere in the same region in such large quantities and under such general conditions that its presence can hardly be attributed to human agency. Yet no other explanation is offered of this curious phenomenon.—Remarks on the series of earthquakes that have recently devastated the southern provinces of Spain, by C. G. Rockwood, jun.—On the structure of the spores or spore-like bodies (*Sporangites huronensis* of Sir J. W. Dawson) occurring in the Devonian formations of North America, by J. M. Clarke.—Denudation of the two Americas, by T. Mellard Reade. In this paper the author follows up the calculations already made by him regarding the quantity of matter annually removed in river water from the surface in England and Wales and some of the river basins of the European continent. Here the Mississippi, Amazons, and St. Lawrence basins are dealt with, the results confirming the provisional assumption that about 100 tons of rocky matter are dissolved by rain per English square mile per annum throughout the world.—On Arctic Interglacial Periods, by Dr. James Croll. It is argued that the Polar Interglacial periods were more marked than the Glacial, and that they neither did nor could exist *simultaneously* in both hemispheres. In a concluding note the author remarks that this will probably be his last paper on questions relating to geological climate, advancing years and declining health obliging him to abandon the subject in order to finish some work in a different field of inquiry which has been laid aside for over a quarter of a century.—Notes on some apparently undescribed forms of fresh-water Infusoria, No. 2 (with Plate III.), by Dr. Alfred C. Stokes.—Palæozoic notes; new genus of Cambrian Trilobites Mesonacis, by Charles D. Walcott.

Bulletin de la Société d'Anthropologie de Paris, 4^e Fascicule, 1884.—The sequel to the "Anthropology of California," by M. Ten Kate.—Observations on the anthropological character and social conditions of the M'zabites, by Dr. Charles Amat, who has added to the results of his personal study of the people a brief summary of their history, derived from the chronicle of Abou Zakaria, translated by M. Masqueray, while he is indebted to a brother officer, M. Motylinsky, for much interesting information regarding the language, which differs entirely from Arabic, and presents close affinities with the dialects of the Berbers. The people, who are a remnant of the ancient sect of the Karidjites, retain many traces of pre-Moslem usages and forms of belief, follow agricultural pursuits, and are the main purveyors of corn in the Sahara.—Notes, by Dr. Hyades, on the Fuegians, considered from a hygienic and medical point of view.—On the significance of the name of the Aryans, by M. Ploix, who attempts to prove its derivation from a Sanscrit root indicating "white." This hypothesis is very forcibly attacked by M. O. Beauregard, who, in a subsequent communication to the Society, brings forward strong evidence to show that the etymological meaning of the term is "noble" or "venerable."—A report on the project of instituting an official anthropometrical examination of the pupils in the primary schools of Paris, by M. Manouvrier.—On the influence of the American medium on the races of the Old World, by M. de Quatrefages.—Notes by M. Pietrement in support of his opinions regarding the age of iron, which had been called in question by M. Mortillet.—Communication, by M. de Rialle, of M. Macey's account of a grave, discovered near Saïgon, Cochin China, in 1882. According to the opinion of the few natives who are versed in local archæology, this grave, which was discovered twelve feet below the surface, dates back at least 400 years. From the lower of the two superposed coffins, besides a few vertebræ and the tibiæ, a cranium was extracted which presents a deep perforation above the right temporal that may be regarded as the cause of the death of the Annamite chief to whom the remains belonged.—Report, by M. de Ujfalvy, of the finds obtained from a Celtic cemetery near Rosegg, in the valley of the Drave. The tumuli, of which there are more than 300, resemble in structure and general contents those opened at Hallstadt and in Styria, but in addition they have yielded a large number of curious little leaden figures of wheels, birds, men on horses, &c., attached to the surface or margins of the various vases.—On some crania from the Merovingian graves at Fermes (Oise), by M. de Maricourt, with an extensive series of measurements, which, according to him, afford strong presumptive evidence of diseases having a scrofulous or syphilitic origin.—On the Gallic rock-tumuli of Port Bara (Quiberon), by M. Gaillard.—On an elephant's tusk found in the valley of the Drance (H. Savoie), by M. D'Acy. This find was obtained at 3000 feet above the level of the sea, and is believed to belong to a relatively recent representative of *Elephas primigenius*.—On the manufacture of fire-flints still existing in France, by M. P. Salmon. This industry is chiefly carried on near Percheriou (Loir-et-Cher), whence large numbers of flints are annually exported to supply the demand still existing for them among Central African and other savage tribes.—Communication, by Dr. Verrier, regarding the work of Dr. Engelmann, of Louisville, on the various modes of delivery prevalent amongst women of different races.—On the different powers of resisting cold shown by various races, by M. Maurel.—On a placental anomaly in a case of twin-delivery, by Dr. Verrier.—Notes on the crania of three idiots, by Drs. Doutrebente and Manouvrier.—Observations on the static and dynamic conditions by which man is enabled to stand erect, by Dr. Fauvelle.—Researches on the so-called "Maye" of Provence, by Dr. Berenger-Ferand. The paper is an enlarged exposition of an earlier notice, which appeared in 1883, on the Provenzal customs of our own times, in which the author sees a survival of the ancient worship of Maia—as are our own May queen, Florrie games, jack in the green, and other May festivals—the long ages of Christianity having modified but not obliterated the traces of paganism.

Rendiconti del Reale Istituto Lombardo, March 12.—Note on the kinetic theory of the gases and on the limits of the terrestrial atmosphere, by Prof. R. Ferrini.—On some geometrical, statical, and kinematic properties of articulated polygons, by Prof. G. Jung.—A comparison of the respective merits of Bellani's lucimeter and the English heliograph constructed by Negretti and Zambra, of London, by Giovanni Cantoni.—On some uniform representations in the higher mathematical analysis, by Prof. Giulio Ascoli.—On some remarkable features of the stratified rocks in the Valtravaglia district, North Lombardy, by Prof. Taramelli.—On the question whether rice should be considered as a contraband of war, by Ercole Vidari.

April 9.—Historical notes on the comet of the year 1472, by Prof. G. Celoria.—On the geometrical movement of invariable systems, by Prof. C. Formenti.—Remarks on the cholera bacilli observed and described by Pacini in his various medical publications, by Prof. L. Maggi.—Further observations on uniform representations, by Prof. Giulio Ascoli.—Note on the traces of Roman jurisprudence in the Longobard edicts, by Prof. P. del Giudice.—Critical examination of the proposed Italian penal code punishments, by E. A. Buccellati.

Bulletin de l'Académie Royale de Belgique, March 7.—A word on the two Balenopteræ cast ashore at Ostend in the years 1827 and 1885, by P. J. Van Beneden.—Observations of Wolf's comet made at the Brussels Observatory (0·15 m. equatorial), by L. Niesten.—Observations of Encke's comet made at the same observatory, by E. Stuyvaert.—On the early epochs of Flemish history, by Alphonse Wauters.—Note on Louis du Tielt, painter and engraver, who flourished at Ypres during the seventeenth century, by Ch. Piot.

SOCIETIES AND ACADEMIES

London

Royal Society, January 22.—"Observations on the Chromatology of Actiniæ," by C. A. MacMunn, M.A., M.D. Communicated by Prof. M. Foster, Sec.R.S.

The conclusions arrived at may in part be summed up as follows.—

(1) *Actinia mesembryanthemum* contains a colouring matter which can be changed into *hæmochromogen* and *hæmatoporphyrin;*

this is present in the other species mentioned above, and from its characters it is provisionally named *Actiniohæmatin*.

(2) It is not actiniochrome (a pigment found by Prof. Moseley in the tentacles of *Bunodes crassicornis*), as its band occurs nearer the violet than that of antiniochrome. Moreover, both actiniochrome and actiniohæmatin can be extracted with glycerin, in which the latter is convertible into hæmochromogen, but the former remains unchanged. Actiniochrome is generally confined to the tentacles, and is not respiratory, actiniohæmatin occurs in the ectoderm and endoderm, and is respiratory.

(3) A special colouring matter is found in *Sagartia parasitica*, different from either of the above, and this too exists in different states of oxidation. It is not apparently identical with that obtained by Heider from *Cerianthus membranaceus*.

(4) In the mesoderm and elsewhere in *Actinia mesembryanthemum* and other species, a green pigment occurs which alone and in solution gives all the reactions of *biliverdin*.

(5) *Anthea cereus*, *Bunodes ballii*, and *Sagartia bellis*, yield to solvents a colouring matter resembling chlorofucin, and all the colouring matter, which in them shows this spectrum, is derived from the "yellow cells" (= symbiotic algæ), which are abundantly present in their tentacles and elsewhere. It is not identical with any animal or plant chlorophyll, as is proved by adding reagents to its alcoholic solution.

(6) When "yellow cells" are present, there appears to be a suppression of those colouring matters which in other species are of respiratory use.

April 23.—"Magnetisation of Iron." By John Hopkinson, M.A., D.Sc., F.R.S.

The paper contains an account of the results of experiments which have been made on a considerable number of samples of iron and steel of known composition, including samples of cast iron, malleable cast iron, wrought iron, ordinary steels, manganese, chromium, tungsten, and silicon steels. The electrical resistance and the magnetic properties are determined in absolute measure. Amongst the electrical resistances the most noteworthy fact is the very high resistance of cast iron, as much as ten times that of wrought iron. The fact that manganese steel is almost non-magnetic is verified, and its actual permeability measured. The action of manganese appears to be to reduce the maximum magnetisation of steel, and in a still greater ratio the residual magnetism, but not to affect the coercive force materially. It is shown that the observed permeability of manganese steel containing 12 per cent. of manganese would be accounted for by assuming that this material consists of a perfectly non-magnetic material, in which are scattered about one-tenth part of isolated particles of pure iron. Some practical applications of the results are discussed.

April 30.—"Further Observations on Enterochlorophyll and Allied Pigments." By C. A. MacMunn, M.A., M.D.

In a paper read before the Royal Society in 1883, the writer described the spectroscopic and other characters of enterochlorophyll which was obtained from the liver or other appendage of the *enteron* of various invertebrates (hence the name). It is now shown that this pigment is *not* due to the presence of symbiotic algæ, or *immediate* food-products, but is built up by the animal containing it.

Taking the six bands[1] of vegetable chlorophyll in alcoholic solution described by Kraus, the first two and the fourth are coincident with those of enterochlorophyll in a similar solution; the third band is, however, frequently missing from the latter. The fifth and sixth bands belong to the yellow constituent, which Hansen shows to be a lipochrome; the corresponding bands in the case of enterochlorophyll also belong to a lipochrome, and are not always coincident with the lipochrome bands of plant-chlorophyll. This was proved by saponifying enterochlorophyll by Hansen's method (as described in NATURE, vol. xxx. p. 224). But saponification of vegetable chlorophpll changes it considerably, as bands of a solution, before saponifying, do not correspond with those of a similar solution after saponifying. Hansen's results were confirmed as far as the separation of "chlorophyll green" and "chlorophyll yellow" are concerned, and the crystals described by him obtained.

While the dominant band of "chlorophyll green" in solutions of plant-chlorophyll is moved much nearer the violet by saponifying, or split up into two in some cases, the corresponding band of enterochlorophyll disappears *in toto*, or remains in the same place. Another difference was also noted in the case of enterochlorophyll and in the case of *Spongilla* chlorophyll, namely, that it is impossible to bring about a *complete* separation of the constituents in most cases by saponifying and treating as Hansen directs.

All the bands of a solution of *Spongilla* chlorophyll are coincident with those of a similar solution of plant chlorophyll, as already proved by Prof. Lankester and Mr. Sorby.

From the enterochlorophyll of *Uraster rubens* crystals of "chlorophyll yellow" and "chlorophyll green" were obtained by saponifying.

Morphologically, enterochlorophyll occurs—as proved by the examination of fresh-frozen sections—in oil-globules, granules, and dissolved in the protoplasm of the liver cells; no starch or cellulose could be found in such sections after adopting the usual botanical precautions.

Hence enterochlorophyll is an animal product, and a chlorophyll, of which there are probably several occurring in animals.

Geological Society, April 29.—Prof. T. G. Bonney, D.Sc., LL.D., F.R.S., President, in the chair.—James Backhouse, Percy Bosworth Smith, and James Shipman were elected Fellows of the Society.—The following communications were read:—On the structure of the ambulacra of some fossil genera and species of regular Echinoidea, by Prof. P. Martin Duncan, M.B. (Lond.), F.R.S., V.P. Linn. Soc. After noticing the general knowledge which exists about the structure of the ambulacra in the Cidaridæ and the elaborate investigations of Lovén on the Triplechinidæ, the author brought before the Society the results of his own work with and without the cooperation of his fellow-worker in the description of the Echinoidea of Sind, Mr. Percy Sladen, F.G.S., and which referred to the Diadematidæ and the Arbaciadæ of the recent faunas. Starting with the knowledge of the construction of the modern Diadematidæ, the author investigated the genera *Hemipedina*, *Pseudodiadema*, *Pedina*, *Hemicidaris*, *Diplopodia*, and *Cyphosoma*. The necessity for the re-establishment of the genus *Diplopodia* was shown, and a new genus, *Plesiodiadema*, was founded. *Pseudodiadema*, shorn of the forms included in these genera, remains and differs more from *Diadema* than has been believed. The method of the growth of the great plates of *Hemicidaris* was explained, and the comparison between the peristomial plates of some of the Diadematidæ and the universal structure of the ambulacral plates in *Pedina* was made. The author considered that there are six types of ambulacra in the regular Echinoidea, so far as the group has been investigated, there still remaining much to be done. These types are the Cidaroid, Diadematoid, Arbacioid, Echinoid, Cyphosomoid, and Diplopodous. In conclusion the succession in time of the structures which characterise these types was considered.—The Glacial period in Australia, by R. von Lendenfeld, Ph.D. Communicated by W. T. Blanford, LL.D., F.R.S., Sec.G.S. Although several previous writers have suggested that boulders and gravels found in different parts of Australia are of glacial origin, the evidence is vague, and no clear proof of glaciation has been brought forward. During a recent ascent of the highest ranges in Australia, parts of the Australian Alps, the author succeeded in discovering a peak which he named "Mount Clarke," 7256 feet high, and in finding traces of glaciation in the form of *roches moutonnées* throughout an area of about 100 square miles. The best-preserved of the ice-worn surfaces were found in a valley named by the author the "Wilkinson Valley," running from north-east to south-west, immediately south of Müller's Peak and the Abbot Range. No traces of ice-action were found at less than 5800 feet above the sea. The rocks showing ice-action are all granitic, and the fact that the surfaces have been polished by glaciers is said to be proved by the great size of such surfaces, by their occurrence on spurs and projecting points, by many of them being worn down to the same general level, and by their not coinciding in direction with the joints that traverse the rock. In conclusion the author briefly compared the evidence of glacial action in Australia with that in New Zealand.—The physical conditions involved in the injection, extrusion, and cooling of igneous matter, by H. J. Johnston-Lavis, M.D., F.G.S., &c. The great disproportion between the displays of volcanic activity in the same volcano at different times, and between the eruptions of different volcanoes, is a subject deserving the most attentive consideration. The violence of a volcanic outburst does not bear any relation to the quantity of material ejected. The union of water with lavas may be compared with the solution of a gas in water; but there is reason to believe that in their deep-seated sources lavas contain little or no water. If igneous matter be extruded through dry strata the eruption might take place without explosive manifestations. But if igneous matter be extruded through water-bearing beds, a kind of dialysis would take place between the igneous and aqueous masses. In this way the tension of the steam in the fluid rock may at last become so great that a fissure will be formed at the surface and volcanic action will follow. In this way the violence of a volcanic eruption will be determined by the quantity of water contained in the strata through which the lava passes in its passage to the surface, and by the temperature at which it reaches the surface. This theory explains the acknowledged sequence of volcanic outbursts of different degrees of violence, and the intervals which occur between them. It also explains the differences between the central and lateral eruptions of a great volcano and the phenomena attending its extinction. The structures of the igneous rocks, whether of basic or acid composition, are greatly modified by the presence in them of volatile ingredients. The succession of events indicated by the structure of Monte Somma and Vesuvius, Roccamonfina, Monte Vulture, and Monte Nuovo show that after a long cessation of volcanic activity we have an extensive production of fragmentary and scoriaceous material, and that this is gradually succeeded by the eruption of lava-streams. The water and other volatile substances, such as sulphates and chlorides, which are given off abundantly in volcanic eruptions, may act as solvents for the various minerals which constitute lavas.

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[1] The five bands in a leaf, as described by Kraus, can be seen by using a micro-spectroscope of small dispersion and good substage achromatic condenser.

Physical Society, May 9.—The meeting was held in the Physics Theatre of Clifton College, Bristol, in consequence of an invitation from the British Naturalists' Society, Prof. Guthrie, President, in the chair.—Messrs. E. Cleminshaw, E. F. Herrom, and A. L. Selby were elected members of the Society.—The following communications were read:—On evaporation and dissociation, by Prof. W. Ramsay and Dr. S. Young. The authors gave the results of a series of investigations undertaken with the view of determining how far the passage of a liquid into a gas resembled the dissociation of a chemical compound. For this purpose the relation between the pressure and temperature of several dissociating substances such as ammonic carbonate, chloral hydrate, and phthalic acid had been examined. The authors hope shortly to publish the full details of these experiments and the conclusions arrived at.—On a model illustrating the propagation of the electro-magnetic wave, by Dr. S. P. Thompson. The model consists of two sets of beads. Each set is composed of a number of beads fixed to the extremities of wires, and by a suitable mechanical contrivance each executes an approximately harmonic motion at right angles to the wires and the mean plane of the set. The phase of each bead differing by a certain small amount from the succeeding, the whole represents a wave-propagation. The two sets are coloured differently and are so placed that their harmonic motions are executed at right angles about the same axis which represents the direction of propagation of an electro-magnetic disturbance, one wave being the electrostatic and the other the electro-magnetic displacement.—On a self-recording stress and strain indicator, by Prof. H. S. H. Shaw. This instrument was designed for one of Wicksteed's 50-ton single lever machines lately erected in the Engineering Laboratory of University College, Bristol, and has been found very simple and effective. In this testing machine the stress is applied by moving a mass of 1 ton along a lever; this mass is connected by a cord with a vertical cylinder upon the indicator. This cylinder carries a paper wound around it, and turns upon its axis as the mass is moved towards the end of the lever. A pencil capable of a vertical motion bears against this, and thus horizontal distances upon the paper are measures of stress. The strain is measured by the vertical motion of the pencil, the position of which is controlled by a wire attached to the rim of a wheel above, upon the same axis of which are other smaller wheels, any one of which can be connected to a fine wire which is carried horizontally to the upper end of the test-piece passing over a pulley fixed to it, and is fixed to the lower end. Any extension of the test-piece can be multiplied at pleasure on the diagram by attaching the wire to a larger or smaller wheel.—Note on the so-called silent discharge of ozone generators, by Mr. W. A. Shenstone. Mr. Shenstone had arranged some apparatus by which this could be viewed. It seemed to have the characteristics of the Brush discharge.

EDINBURGH

Royal Society, April 20.—Robert Gray, Vice-President, in the chair.—In a paper on the effect of pressure on the temperature of minimum compressibility of water, Prof. Tait showed that the various results obtained admitted of easy deduction from theory.—A note on the variation by pressure of the melting-point of paraffin, &c., by Mr. W. Peddie; and a note on the thermal effects of tension in water, by Mr. G. N. Stewart, were submitted by Prof. Tait.—Mr. Hugh Robert Mill read a paper on the temperature of the water in the Firth of Forth, describing the work done at the Scottish Marine Station in this direction. The annual range of temperature, from summer maximum to winter minimum, was found to vary from nearly 40° F. at Alloa, where the river is fresh at low tide, to 20° at Queensferry, twenty miles seaward, and 10° at the mouth of the Firth thirty-five miles further on. The mean temperature of the water appeared to be the same—47°·5—at all parts of the estuary. From June to September the river was warmer than the sea, from October to May it was colder, the average rise or fall in temperature at any time along the Firth being 0°·07 per mile. During the summer period the surface-water had a higher, and during winter a lower, temperature than that beneath. The annual minimum was reached in February, the maximum in August, and there were indications of the period being delayed toward the open sea. Materials are unfortunately wanting for discussing the variations of temperature in the North Sea beyond the influence of land. Mr. Mill showed curves of the monthly mean temperatures of the water plotted by the use of polar coordinates. Each month was represented by an angle of 30°; the temperature being measured on the radius, equal values were shown as concentric circles. Temperatures so plotted appear as closed curves, and in several cases those for the water resembled a circle placed eccentrically to the circles of reference. This method of curve-drawing has several advantages over that by the use of rectangular coordinates where periodic phenomena are to be represented.—Mr. J. T. Cunningham, of the Marine Station, read a paper on the relations of the yolk to the gastrula in teleosteans and in other types.

Mathematical Society, May 8.—Mr. A. T. G. Barclay, President, in the chair.—Prof. Chrystal read papers on repeated differentiation, and on a process for finding the differential equation of an algebraic curve. Dr. Thomas Muir made a communication on integration formulæ, and gave a historical note on the so-called Simson line.—Mr. J. S. Mackay contributed several mnemonics for certain mathematical constants.

SYDNEY

Linnean Society of New South Wales, Feb. 25.—Prof. W. J. Stephens, M.A., F.G.S., President, in the chair.—The following papers were read:—On some reptiles from the Herbert River district, Queensland, by William Macleay, F.L.S., &c. Five new species are here described, *Hinulia picta*, and *Tetradactylus guttulatus* of the family Scincidæ, and of Ophidians *Nardoa crassa*, *Tropidonotus ater*, and *Hoplocephalus assimilis*.—Notes on certain Ceylonese Coleoptera, described by the late Francis Walker, by A. Sydney Olliff. In these notes Mr. Olliff, who had examined Mr. Walker's types in the British Museum, endeavours to clear up the synonomy of the Clavicorn families. The name *Asana* was proposed for the *Trogosita rhyzophagoides* of Walker, which cannot be referred to any known genus. In form it resembles *Lipaspis*, but is characterised by the presence of a scutellum.—On the flight of birds, by R. von Lendenfeld, Ph.D.

PARIS

Academy of Sciences, May 11.—M. Bouley, President, in the chair.—Remarks on the application of photography to the mapping of the stars by means of MM. P. and Pr. Henry's new objectives, by M. Mouchez. The first essays with an objective of 0·16 m. and a provisionary apparatus proved so successful, that a new instrument has been constructed with two objectives of 0·24 m. and 0·34 m. respectively. Although not yet completely regulated, this instrument has already yielded some remarkable results, fully justifying, if not exceeding, the hopes entertained by astronomers. It appears to have once for all solved the problem how to apply photography to the construction of a map of the heavenly bodies which shall include stars of the 14th and 15th magnitudes.—On the spontaneously reversible spectral rays, and on the analogy between the laws of their distribution and intensity with those of the hydrogen rays, by M. A. Cornu.—On the electric conductibility of solid mercury and of pure metals at low temperatures, by MM. Cailletet and Bouty. From numerous experiments made with mercury, silver, tin, aluminium, magnesium, copper, iron, and platina, the authors conclude that the electric resistance of most pure metals decreases regularly when the temperature is lowered from 0° to −123°, and that the coefficient of variation is apparently much the same for all. It seems probable that the resistance would become extremely slight at temperatures lower than −200°, although this point has not yet been practically tested.—Note on the action of aluminium on the chloride of aluminium, by MM. C. Friedel and L. Roux.—An inquiry into the reason which renders mechanical exciters incapable of bringing into play the excito-motor regions of the brain proper, by M. Vulpian.—Remarks on MM. A. F. Marion and G. de Saporta's "Evolution of the Vegetable Kingdom," by M. Duchartre.—On a method of reconnoitring the enemy's position at great distances with a description of the telemetrograph, an instrument invented for carrying out these operations (one illustration), by M. A. Laussédat.—On the cure of progressive myopy by the processes of iridectomy and sclerotomy, with remarks on the theory of this ophthalmic affection, by M. H. Dransart.—Note on the theory of the figure of the earth, by M. O. Callandreau.—Remarks on a new and accurate method of astronomic observation by means of a fixed lunette attached to the meridian, by M. Ch. von Zenger. By this simple process the angle of position and the distance of the double stars may be determined and measurements taken of the parallax of the sun or the stars. For simple observations a precision of 0″·02 may be relied upon which is considerably greater than that hitherto obtained by the use of the most accurate and powerful meridian lunettes.—Results of experiments undertaken at the national powder mills of Pont-du-Buis with the regulating apparatus of two turbines for the purpose of testing the conclusions deduced from M. Léauté's memoir on oscillations at long intervals in machinery set in motion by hydraulic agency, by M. A. Bérard.—On the polarisation of the metallic capillary tubes by the flow of fluids under high pressure, by M. Krouchkoll. When a conducting fluid is driven through a capillary metallic tube at a pressure of less than fifteen atmospheres, the tube and the fluid being placed in communication with the mercury of a capillary electrometer, no polarisation of the tube takes place. But if the pressure be raised, the author shows that the tube begins to become polarised, the polarisation increasing with the pressure.—Description of a new electric pile, at once simple and cheap, which has been named the "self-accumulator" by the inventor, M. Jablochkoff. For this pile it is claimed that it emits no odour, that it utilises the local currents which are so troublesome in ordinary piles, and especially that it supplies electric power at a very low price, for in it filings, cuttings, and other waste forms of metals may be employed.—On the tensions and critical points of some vapours, by MM. C. Vincent and J. Chappuis. The author's observations are here confined to hydrochloric acid and the chloride of methyl, the object being to show how the maxima tensions of a series of liquefied gases vary with the temperature, to determine the critical points of these products, and to compare the results obtained for the purpose of verifying the hypotheses advanced by MM. Nadejine and Pawlowsky. — Note on the oxychlorides of aluminium, by MM. P. Hautefeuille and A. Perrey.—On the apparent volatilisation of silicum at a temperature of 440°, by MM. P. Hautefeuille and A. Perrey.—Note on a method of preparing arsenical acid, and on the existence of combinations of arsenious and arsenical acids, by M. A. Joly.—On the limit of combination for the bicarbonates of magnesium and potassium, by M. R. Engel.—On a hydrochlorate of protochloride of chromium, by M. Berthelot.—A calorimetric study on the effects of the tempering and cold-hammering of cast steel, by M. Osmond.—Remarks on the mineralogical constitution of the Sierra Nevada of the Iberian Peninsula, by M. Guillemin-Tarayre.—On the liberation of carbonic acid and the absorption of oxygen by leaves kept in dark places, by MM. P. P. Dehérain and L. Maguenne.—Note on a new gutta-percha plant, by M. E. Heckel. As a substitute for the Isonandra gatta, Hooker, which is threatening to disappear, the author proposes the *Butyrospermum Parkii*, Kotschy, which possesses similar properties, and which is widely diffused throughout equatorial Africa, between Upper Senegal and the Nile basin.—A fresh contribution to the question of the origin of boric acid: analysis of the Montecatini waters between Florence and Pistoja, by M. Dieulafait.—On an arrangement enabling the observer to follow with the eye the phenomena presented by aquatic animals subjected to a pressure of 600 atmospheres, by M. P. Régnard.—On a new apparatus intended to detect infinitesimal quantities of blood wherever present in fluids or on solid substances, and named the "hema-spectroscope" by the inventor, M. M. de Thierry.—On pathological urines, by M. A. Villiers.—Note on a method for measuring the intensity of sensations, and especially those of colour, by M. Aug. Charpentier.—On the formation and development of the spores in *Cladothrix dichotoma*, by M. A. Billet.—A study of the Bacterium ureæ, by M. A. Billet.—Remarks on the cause of a new epidemic recently prevalent amongst the domestic ducks in the neighbourhood of Castres, Tarn, by M. A. Caraven-Cachin. This disease, which at one time raged with great violence, was ultimately traced to the leaves of the *Ailantus grandulosa*, Desf., or varnish of Japan, growing in the district and eaten by these birds.

BERLIN

Physiological Society, April 17.—Prof. Busch spoke on anomalies in human teeth, and illustrated his observations in part by preparations laid before the Society, in part by plaster casts. In the first place he treated of anomalies of situations he had observed in teeth—the horizontal position of a wisdom tooth, which, pressing against the third molar, produced inflammation in the latter; the projection of teeth through the aveolar wall of the maxilla on the anterior or posterior side, an occurrence happening mostly in the case of permanent canine teeth which pushed their way through at a late period, when there was no place left for them in the jaw; the exchange of situation between the canine tooth and the first bicuspid in the order of the teeth. Another kind of anomalies respected the number of the teeth, especially of the incisors. Instead of the normal number of four in each jaw, five were now and again observed, and in a few, very rare, cases, as many as six. On the other hand, there were cases of only two incisors with a correspondingly large lacuna. The failure of the wisdom tooth was not a rare occurrence. Anomalies of dental structure the speaker illustrated by pieces of ivory, which presented very remarkable deviations from the normal course of their fibres. In human teeth there had to be considered under this head enamel pearls, that is, smaller or larger round drops of enamel adhering to the roots, and having no connection with the crown. Anomalies of size were very rare. The breadth of the physiological variations amounted to about 3 to 5 mm. Now and again, however, enlargements were observed as high as 10 mm., and diminutions as low as to 0·9 cm. In the latter case crown and root had each transformed itself into the shape of a cone. Enlargements affected the root more frequently than the crown. Anomalies of the root were sometimes seen in curves shaped like an S or hook, but more frequently in the increase or diminution of the number of the roots. More than five outspread roots, more or less perfect, had never been observed. Molars of the lower maxilla were not unfrequently found with three, and bicuspids with two separate roots. In incisors and canine teeth divisions of the tips of the roots were occasionally found with two pulps, or more or less deep segmentations. A diminution, as well as an increase in the number of the roots had also been observed; yet was the coalescence of separate roots of rarer occurrence than their increase by splitting. The frequency of the anomalies referred to was not great. Out of nearly 11,000 teeth examined, only about 100 anomalous specimens had been found. Still more seldom did swellings occur on the teeth. These were sometimes soft, and consisting of connective tissue; sometimes completely calcified without containing one of the tooth tissues differentiated; sometimes situated on the crown, sometimes on the root. These Odontoma, like the teeth themselves, were always to be found in particular grooves of the maxilla. No osseous coalescence of the teeth and maxilla had ever been observed. At the close the speaker produced casts of gums which showed very considerable variations in their curves, ranging from an entirely flat up to a highly arched form.—Prof. Christiani communicated briefly the results of experiments carried out by Herr Gnezda on the poison of the cobra di capello (*Naja tripudians*). The poison was obtainedin India by causing the snakes to bite into snails or mussels wrapped in gutta-percha and filled with water. The watery solution thus obtained was reduced by evaporation. Of its physical and chemical qualities it was to be remarked that the poison belonged to the class of propeptons. Experiments were instituted with representatives of all the vertebrata. They were all susceptible of the poison, and died when the dose of the poison amounted to 3mg. per kilogramme animal. The time when death followed a full dose of the poison was very various. Rabbits died after half an hour, pickerels after an hour, frogs later, then cats, and lastly pigeons. Stronger doses hastened death. Dilutions and the introduction of artificial respiration delayed death. The physiological effect extended principally to the central nervous system. The muscles and the peripherical nerves continued irritable, although paralysis set in very soon. Seldom were spasms and compulsory movements observed. The poison appeared to have hardly any effect at all on the heart.

Physical Society, April 24.—Dr. Kayser reported on a recent paper of Prof. Bunsen (*Wiedemann's Annalen*, 1885, Heft 3) in which the differences between the results of the speaker's experiments regarding the absorption of carbonic acid on smooth glass surfaces and those published by Prof. Bunsen two years ago received their explanation. While, namely, Dr. Kayser had found that the absorption of carbonic acid proceeded according to definite laws formulated by him, Prof. Bunsen had observed that this process of absorption did not terminate even after as long a period as three years, but still continued, even though at a reduced rate. In his most recent work Prof. Bunsen had now established that the glass threads, even after a current of dry air had been for a considerable time directed over them, still retained a layer of water which was thin in proportion as the temperature was high, but did not become entirely dissipated till the temperature reached as high as about 500° C. This layer of water it was which absorbed the carbonic acid, and all the more powerfully the denser was the layer of water. The density of the water, however, stood in inverse relation to its thickness. From these experiments Dr. Kayser concluded that the absorption of carbonic acid on the glass threads which Prof. Bunsen had observed continuing for so long a period was only an absorption of the gas by the adhering water and no absorption on the smooth glass surface, whereas in the speaker's experiments, in which the glass threads had in boiling oil been freed from all adhering matters, the carbonic acid had been absorbed by the smooth glass.—Dr. Less spoke of two curves placed before the Society, as markings of the barograph on April 22 and 23 during the time of the brief thunderstorm in Berlin. The two curves presented in general an analogous course, concurring, moreover, with curves which Dr. Less had observed last year during the severe July storm. Before the outburst of the thunderstorm the curves sank slowly, next rose steeply to a considerable height; with the attainment of the maximum of pressure coincided the stroke of lightning; the curve then maintained itself at a level for some time, throughout which the thunder-shower or hail was wont to fall; on the cessation of rain the curve of atmospheric pressure sank steeply to beneath the former minimum. In the two April curves a further sudden rise preceded the second weaker stroke of lightning, and there then followed several smaller jerkings of the curves coinciding with the time of the formation of clouds consequent on the short thunder-storm. In the curves of the July of last year during the severe storms so copiously charged with lightning, the apex of the curves after the sudden ascent was not straight, but consisted wholly of short indentations each of which appeared to correspond with an individual lightning stroke, so far as it was possible to fix the precise times. The sudden steep ascent of the curve on April 22 and 23 coincided with a sudden increase in the force of the wind, which soon, however, fell weaker, and at last sank almost to complete stillness. The speaker also reported the corresponding numerical values for the variations of atmospheric pressure marked by the barograph.

Vienna

Imperial Academy of Sciences, March 5.—Contribution to a knowledge of Coniopterigidæ, by F. Löwe.—On a new morphological element of peripheric nerves, by A. Adamkiewicz.—On the sensibility to light and colours of some marine animals, by V. Graber.—On some propagatory organs of the fruits of Compositæ, by M. Kronfeld.—On the fauna of the Jurassic deposits of Hohenstein, Saxony, by G. Bruder.—On mannite lead-nitrate, by A. Smolka.—Note on Löwe's lead-nitrate and on Morawski's penta-plumbonitrate, by the same.—On the temperature of Vienna and its environs, with a study on the action of local influences on the mean temperature, by T. Hann.—On camphoronic acid, by T. Kachler and F. V. Spitzer.—On the daily and yearly course, and on the period of disturbances of magnetic declination at Vienna, by T. Liznar.

March 12.—On nerve-corpuscles, by A. Adamkiewicz.—On the use of boiling oxygen, nitrogen, carbon oxide, and atmospheric air as a freezing-agent, by S. von Wroblewski.—Contribution to a knowledge of the texture of hyaline cartilage, by E. Zuckerkandl.—On the Upper Italic flora of the Lunz strata and of the bituminous slate of Raibl, by Dr. Stur.

March 19.—Crystallographic researches on camphor derivates, by V. von Zepharovich.—Experimental studies on the determination of the constant of dielectricity of some gases and vapours, by T. Klemencic.—On the planes of solution of calcareous spar and arragonite, by V. von Ebner.—On figures obtained by corroding arragonite, by the same.—On a meteoric explosion observed at a distance of 1000 metres by R. Spitaler on March 15, by E. Weiss.

Upsala

Society of Science, April 17.—The following paper, by Dr. K. B. J. Forssell, was accepted for insertion in the Society's *Journal*:—"Beiträge zur Kenntniss der Anatomie und Systematik der Gloeolichenen." Prof. Lilljeborg described a *Metridia armata* (Boeck) taken in the Antarctic Ocean (lat. 54°-5° S.), and suggests that it was probably found near both poles. It was taken by Capt. Schéele, of the Swedish barque *Monark*, an amateur scientist to whom the Society had lent instruments, vessels, and apparatus for deep-sea researches. He further exhibited *Pluroma abdominale* (Lubbock), also taken by Capt. Schéele in the South Atlantic. It was remarkable as having an appendicular eye on the side of the head.—Prof. Hildebrandsson spoke about the twilight phenomenon, specially with reference to some observations of the purple glimmer then prevailing, made by Dr. Gyllenskjöld.—Prof. Clason gave a lecture on the functions of certain parts of the brain.

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